CITY OF RALEIGH

DOWNTOWN DEVELOPMENT AND FUTURE PARKING NEEDS STUDY

CURB LANE MANAGEMENT POLICY
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Prepared for:

Prepared by:
Kimley»Horn

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INTRODUCTION

When a parking system works well, it often is an overlooked experience. However, when it causes confusion or frustration, it leaves a person with a negative impression and becomes a deterrent. Often the cause of a negative parking experience is ill-managed curbside uses. Curbsides are used by several groups, including transit, motorists, delivery trucks, and taxis—each having differing parking needs as they relate to conducting activity at the curb. To balance the needs of the various users, the City of Raleigh implements restrictions along the curb lane as a management tool, including time and user restrictions, and pricing. The following sections provide a summation of best management practices for the varied uses along the curb.

CURBSIDE MANAGEMENT PROGRAM

A curbside management program consolidates and efficiently manages the environment so that curbside uses are consistently managed throughout the City, allowing for easier access to businesses and residences and lessen confusion of where, when, and how to park. Motorists can then easily navigate to available parking, reducing the number of parking violations and improving mobility throughout the City. Easier parking also minimizes the time spent searching for an available parking space and reduces congestion and the adverse environmental impacts related to congestion.

The act of implementing a curbside management program includes defining practices, policies, and tools to better use curb space in an urban setting. The strategies of a curbside management program are intended to:

- Balance competing needs

- Move people and goods efficiently

- Support business district vitality

- Create livable neighborhoods

- Improve on-street parking operations

- Prioritize curbside practices and structure to best fit the needs of the adjacent users

- Identify technologies to support policies and practices.

PRIORITIZING COMPETING USES ALONG THE CURB

There are many varied curb lane uses, including on-street parking, traffic/vehicular capacity, transit movements, commercial loading, passenger loading, parklets, bicycle parking, and business support. The hallmark of a good curbside management program is the prioritization of those uses. The prioritization will likely change from area to area, but the definition of the priority enables the City to easily communicate curb lane policy decisions by vetting those decisions with the priorities in mind.

The City will need to determine its optimal priority, but the components should include the following:

- **On-Street Parking** – The provision of high-priority parking spaces to support commercial business activity in the Downtown area

- **Vehicular Capacity** — The movement of vehicular traffic to ease congestion

- **Transit Movements** — Primarily the loading and unloading of transit passengers in the Downtown area

- **Commercial Loading** — The efficient delivery of goods to support Downtown businesses

- **Passenger Loading** — The efficient delivery of patrons, employees, and residents to the Downtown area

- **Business Support** — Including the use of spaces to promote Downtown business activity and vitality

STANDARDIZED BLOCK FACES

In an effort to standardize the approach and structure to locating the primary curb lane uses, it is recommended that the City consider implementing standardized block faces. The intent of a standardized block face is to provide consistency along the Downtown curb lane, which supports a positive user experience, consistent expectations, and streamlined management. Under a standardized block face, various uses are grouped together to maximize consistency and curb lane efficiency and to prevent fragmentation of curb lane uses. It is acceptable to deviate from the standard block faces as needs dictate, but the consistent structure sets expectations for business owners when requesting dedicated loading spaces or other curb uses to support their businesses. This structure also enables the City to communicate the true intent of the curb lane policy.

ON-STREET PARKING

The primary use along the curb front in an urban setting is on-street parking, which is appropriate because it is the most sought after and used curb use throughout Downtown Raleigh. On-street parking should be considered one of the primary priorities. It also should be regulated in a manner that provides accessible and convenient spaces with logical structure, signage, regulation, and payment options. As an example, it is not feasible to have short duration parking in the same area as longer duration parking because motorists could confuse the two, leading to unwanted enforcement issues and an unsatisfying user experience.

EXISTING CONDITIONS

The on-street parking system in Downtown Raleigh has over 1,200 metered parking spaces and approximately 3,400 unmetered parking spaces. These spaces are regulated by a combination of time limits, including 15 minutes, 30 minutes, 1 hour, and 2 hours. The spaces are enforced from 8AM to 5PM, Monday through Friday. The metered spaces are typically $1.00 per hour, except for the spaces along Fayetteville Street, which are $1.25 per hour. Metered spaces are paid for either using pay stations (coin and card) or a mobile-phone app provided through Passport. The existing parking meter system works well for its intended purpose, but could use a better interface and supporting hardware to make the system more customer friendly.

RECOMMENDATIONS AND BEST MANAGEMENT PRACTICES

The following sections provide recommendations related to the location, orientation, regulation, and application of on-street parking throughout Downtown Raleigh.

BLOCK FACE LOCATION

In an ideal setting, on-street parking would be the central use along a block, buffered by loading zones or taxi stands. However, in some locations it may be necessary to locate on-street spaces at the end of a block to account for transit or commercial vehicle loading. In other locations, especially in evening operations, it may be necessary to locate on-street parking on the end of blocks, buffering valet parking operations.

Of all the curb uses identified in this document, on-street parking needs to remain the most flexible in its location and placement. However, one constant that should be applied throughout Downtown Raleigh is to provide similar groupings of on-street spaces. Short duration parking (e.g. 30 minute limits) should not be included within the same block that has mostly two-hour parking. Similarly, passenger loading, commercial vehicle loading, and taxi stands should not be placed in the center of on-street parking sections. Rather, these uses should be located to buffer on-street uses from the intersection. The application and location of on-street parking should be decided based on adjacent land uses and competing curb lane needs.

ORIENTATION

Throughout Downtown Raleigh, parking is primarily oriented parallel to the curb face. This is a factor of available right-of-way and road space, which is not likely to change significantly as Downtown Raleigh continues to evolve. As development and redevelopment continues to occur, parallel parking should remain the orientation of choice. This provides for varying uses throughout the day (e.g. on-street parking to vehicular capacity during peak hours) and allows for the most efficient movement of transit throughout the area. The City should be aware of alternative parking orientations which could be considered for new or redeveloped locations to provide additional parking capacity or street traffic calming. For those areas of Downtown Raleigh considering traffic calming or road conversions, other methods may be appropriate based upon the available street right-of-way.

TIME LIMITS AND RESTRICTIONS

The use of time limits and restrictions is a tool used to enact turnover and circulation within parking spaces, providing greater exposure for adjacent retail throughout the day. Within Downtown Raleigh, the time limits are generally 2 hours or less. Generally, this policy is appropriate and should be maintained throughout the community. However, in certain locations, especially with a higher influence of short-term retail stores (e.g. coffee shops, dry cleaners, take-out food) the City could consider using short-term customer convenience zones to provide a larger capacity of quick turn over parking.

By implementing a shorter duration time limit, such as 30 minutes rather than 2 hours, a parking space could turnover 16 times in an 8-hour period, rather than 4 times. If an average shopping trip takes 30 minutes and an average purchase level is $5.00, a retailer could make an additional $60 per day or a little more than $15,000 per year. Conversely, on the fringe areas of Downtown Raleigh, where parking utilizations are lower, the City could consider providing longer term parking based on demand.

TECHNOLOGY

The City began implementing pay-by-space meter technology several years ago to make the on-street parking experience more consumer friendly as well as enhance revenue collection, operations, enforcement, and administration. The City should continue to implement the new meter technology and real-time space availability in phases throughout the Downtown area. Based on occupancy and revenue data collected throughout the year, the City should identify areas of higher occupancy and continue to expand its pay station coverage area.

To justify the implementation of the machines, the City should review historic revenue data to understand how pay stations have affected revenue stream. This review also should include a quantification of the reduction in collection, operations, and administration costs related to the implementation of the new meters. Using this data, the justification for increased pay station coverage should be more apparent.

Additional technology options could include the use of smart phone applications or in-car navigation systems to direct motorists to available parking and to communicate changes to curb lane restrictions. The data used to drive this type of application could be collected at a basic level through simple revenue collection data from the pay stations or at a more advanced and accurate level through wireless vehicle detection sensors. With either approach, the City can begin to provide real-time information for Downtown Raleigh motorists, helping to guide them to specific parking spaces or areas, ultimately reducing congestion.

License Plate Recognition Technology

License Plate Recognition (LPR) technology also can be used to enhance enforcement practices and collect parking behavior data that can help the City make parking management decisions. LPR technology consists of two cameras that are mounted to the roof of enforcement vehicles. The cameras on the vehicle take pictures of the license plates of parked vehicles along the street. Inside the vehicle is a laptop or tablet device that has a program that allows officers to view their current location in the parking system and the current reads (or pictures of license plates). Specifics of the City's parking system, such as time limits and permit information, can be loaded in to the program so that the enforcement officers can determine violations associated with those regulations. The data also is stored in a back-end system for the City. The City can determine the length of time appropriate for storing this information. This stored information can be compiled and used to analyze the parking behaviors in the system.

LPR Use for Enforcement Practices

LPR technology enhances and streamlines enforcement practices by enabling officers to identify violations easier and faster. Typically, parking violations are identified using some method of chalking vehicles. This requires officers to make frequent stops to identify violating vehicles and make notes on the vehicle and the violation. LPR technology automates this process by taking pictures of the licenses plates of parked vehicles and stores them in a back-end database. As officers make their route each hour, the software notifies the officers of any vehicles in violation. LPR has the capability to store any information that can be tied to a license plate number, including various types of parking permits, whether the meter was paid (if the parking meters are pay-by-license plate), and how long they have been parked in a space. LPR technology allows officers to view violations through the LPR computer and issue citations as necessary without having to manually enter data.

Data Analytics of LPR and Program Planning

The data collected from the LPR unit can be used to perform several analyses related to the parking behaviors in the system. Understanding these behaviors enables City decision-makers to make policy and regulations decisions that are data-driven and specific to how the system operates. Data from the LPR unit can be read in Excel. The data outputs from LPR contain the time stamp, GPS coordinates, and license plate number for each read the LPR unit collects while the enforcement officers make their rounds. The license plate number acts as a unique identifier, enabling the City to not only determine how many vehicles are parked along a block each hour, but also determine how long vehicles are parked and their movement behaviors throughout the area. This information allows the City to make parking management decisions that are based on actual data from their parking system.

Furthermore, the LPR unit can assist officers with identifying scofflaw offenders that have been issued multiple citations. Officers can view previous citations issued for a vehicle and the associated violations. This information can then be used by the City to identify parking regulations that are commonly violated and adjust management practices or policies accordingly.

PARKING RATE STRUCTURE

In an ideal parking system, on-street parking rates are set higher than the off-street rates to entice motorists to direct long-term parking trips into off-street parking facilities. However, the off-street system in Downtown Raleigh is currently set higher than the on-street rates, which creates an environment where patrons compete for on-street spaces rather than attempting to park off-street.

As it is, the current on-street rate of $1.00 per hour is slightly below average parking rates, especially when compared to peer cities throughout the United States. The City should explore raising on-street parking rates to better manage parking demand, prioritize short-term parking use, and influence parking turnover. Additionally, the City should consider extending hours of paid parking to better manage evening parking and promote turnover near retail and restaurant business.

The City should also consider an expansion of its tiered pricing structure for the on-street parking system, with higher rates set in higher demand areas (as they are now for Fayetteville Street) and lower rates (and longer time limits) for fringe and lower demand areas. The next section discusses the implementation of a Variable Parking Pricing Program, which takes a data driven approach to implement and manage parking pricing based on usage and evolving demands.

TABLE 1: PARKING RATES

PARKING RATES	
LOCATION	HOURLY ON-STREET RATE
Asheville, NC	$1.25
Chapel Hill, NC	$1.50
Charlotte, NC	$1.00
Raleigh, NC	$1.00 - $1.25
Norfolk, VA	$1.00 - $1.80
Alexandria, VA	$1.25 - $1.75
Columbia, SC	$0.75
Nashville, TN	$1.00 - $1.50
Atlanta, GA	$2.00
Austin, TX	$1.00
San Antonio, TX	$1.50
Houston, TX	$0.10 - $5.00
Phoenix, AZ	$1.50
Salt Lake City, UT	$1.00
Denver, CO	$1.00
Portland, OR	$1.60

VARIABLE PRICING APPROACH

The City of Raleigh should consider a data driven approach to managing its on-street parking, primarily using a variable or dynamic pricing model. Variable pricing is a parking management strategy that changes pricing to reflect varying demands across a system to reach an optimal parking occupancy of 85-98%, an industry standard. Variable pricing strategies are structured to meet and mitigate the varying demand patterns observed throughout the day, week, season, and during special events. When demands are higher than the 85-95% threshold, prices are raised to balance demand. When demands are lower than the defined threshold, lower rates are applied to incentivize motorists to park in those spaces.

The primary objectives of using variable pricing strategies are to:

- Employ a parking pricing strategy that directly reflects actual demands

- Increase access to Downtown businesses by supporting space turnover

- Provide easy to find on-street parking

- Incentivize the use of off-street parking for longer term transactions

- Reduce cruising

- Mitigate traffic congestion

- Reduce greenhouse gas emissions

The following sections provide general guidance for the implementation of a variable parking pricing program.

RATE STRUCTURE

The following elements make up the variable parking pricing rate structure.

Adjustment Periods

In a variable parking pricing program, parking rates are adjusted incrementally to reflect demands and balance parking utilization across the system. As rate adjustments occur, parking behaviors and subsequent demands also adjust in response to changes in parking price. Defining how often adjustments occur allows for motorists to be prepared for price changes, as well as defines analysis periods for City staff. Adjustment periods can occur on an annual, quarterly, monthly, biweekly, or even daily basis. The selection of an adjustment period is highly dependent on the source and reliability of data to be collected to support adjustment decisions. For example, daily rate adjustments would require a highly reliable stream of real-time data, while an annual adjustment will likely only require a comparison of monthly data that could be collected manually or through existing

technology. Additionally, rates that are changed too frequently can be confusing to drivers and likely will not result in improved efficiency in the parking system.

Recommendation: Quarterly to annual rate adjustment periods are likely the most realistic for the City of Raleigh. Data streams will dictate the reality of implementing quarterly adjustments versus annual adjustments. During early phases, the City should evaluate the ability to collect and analyze data and finalize the recommendation to set rate adjustments. Policy should allow for as little as once a year and as much as four times per year. For the communities who have implemented variable rate pricing, the primary period for rate adjustments is biannually (2 to 4 times per year). Some programs, which use labor intensive data collection processes are only adjusted once per year. Those with a more technology-focused (sensors or meter data) data analysis process are able to adjust every 3 to 6 months.

Rate Adjustment Restrictions

Restrictions to rate adjustments provide a reasonable and measurable value for increasing and decreasing rates to influence parking demands, ensuring that changes to rates do not vary severely between adjustments. This is very helpful in the communication and acceptance of rate adjustment practices. For most peer variable parking pricing programs, restrictions to rate adjustments were to be no greater than $0.50 per adjustment period, but could be as low as $0.25 per adjustment.

Recommendation: The City should set the rate adjustment intervals at no less than $0.25 and no higher than $0.50 per rate setting interval after the initial rate setting period following this study.

Rate Floor and Ceiling

Setting a rate floor and ceiling has two intended effects. First, the rate floor does not allow the rate to be set too low to negatively influence the ability to cover the cost of providing parking management. For example, in some systems with single space smart meters, parking transaction processing costs can be too negatively restrictive if rates are set lower than $0.75 to $1.00 per hour. Second, the rate ceiling helps to define an upper threshold that keeps the City from aggressively setting rates in high demand areas. In many situations, prices in high demand areas could continue to climb without major impacts to parking demand because the businesses and/or attractions in that area are so great that their demands exceed an aversion to cost.

Recommendation: The City should set its rate ceiling at a level that allows flexibility in price without creating negative public backlash. The ceiling should also provide some flexibility in

future years. For the initial implementation of the program, the ceiling should be set at $6.00 per hour and the floor at $0.75 per hour. While the rates implemented are not likely to approach this ceiling under current conditions, a higher ceiling requires less policy changes in future years and allows for better evaluation and management of the program.

Target Occupancy

The goal of a variable parking pricing program is to reach target parking occupancies throughout the system, creating more space availability overall, while balancing demands in lower demand fringe areas. Most programs define a target occupancy to ensure pricing strategies are applied appropriately. Ideal parking occupancies differ between variable parking pricing programs, ranging from 65 to 95%.

Recommendation: The City should set its ideal target occupancy range at 75 to 85%. The following considerations should apply:

- When occupancies are below 75%, downward rate adjustments should be considered.

- When occupancies are above 85%, upward rate adjustments should be considered.

- Rate adjustments should be adjusted based on how far they range from the target occupancy.

  - Occupancies between 60 and 75%and 85 and 90% should see smaller adjustments

  - Occupancies less than 60% and higher than 90% should see higher adjustments

TECHNOLOGY AND DATA COLLECTION

Variable parking pricing programs rely on a variety of parking technologies to operate successfully. The types of technology included in a program, however, can vary from highly complex, such as that used in the City of San Francisco's SFPark program, to a more low-tech strategy, such as that employed by the City of Seattle. Similarly, the technology used to support the variable parking pricing program can vary in cost and complexity. The following section will review the capability of existing technology to support a variable parking pricing program and will identify the technologies that can be implemented within a high-, mid-, or low-cost variable parking pricing program.

Parking Meters

Primarily, the City uses Duncan multispace meters to regulate its on-street parking system. The version of Duncan meters that are currently installed might not be advanced enough to allow for back-end adjustments to meter rates and restrictions from a remote location. While this limitation reduces efficiency when it comes to quickly and easily applying variable parking pricing, changes to meter rates can be done by coordinating the changes through the parking meter vendor.

So, while the existing meters can support variable parking pricing strategies, newer meters are likely more compatible and more supportive of the City making its own remote changes to meter rates and regulations. If the City chooses to implement a more technical, more complex pilot, the existing meters should be considered for replacement.

High-Cost: In-Ground Sensors

The data provided by in-ground sensors can identify where vehicles are parked at unpaid meters. This information can be sent to enforcement officers who can travel to the vehicle and evaluate whether the vehicle was improperly parked and issue a citation accordingly. The directed enforcement structure allows parking officers to operate more efficiently but requires the use of in-ground vehicle sensors, which can be costly to install and maintain. Directed enforcement also can be a challenging strategy because it has the potential for negative public perception. The directed enforcement needs to be conducted as a means of managing the variable parking pricing program, ensuring that vehicles are complying with posted regulations. Directed enforcement should not be conducted to collect additional revenue. While the cost of sensors has reduced over the past few years, they still require both capital and ongoing maintenance/data cost. These prices vary, but traditional sensor implementation could be as much as $200-$300 per sensor and monthly operation/data costs of an additional $20-$30 per month for the back-end software.

Mid-Cost: Additional Enforcement Officers

The application of additional layers of regulation and policy within the program may make it difficult to enforce the system with the current number of enforcement officers. To effectively enforce the area within hourly time periods, the City should consider additional enforcement staff. A good rule of thumb for these types of programs is to have enough staff to cover a dedicated route in less than an hour. That often requires one officer for every 200 to 400 spaces. The cost of additional enforcement will vary based on role and responsibility but on average, a City of Raleigh enforcement officer is budgeted at $46,099 per year (salary and benefits).

Low-Cost: Existing Technology and Resources

Using existing hand-held and tablet technology and enforcement officers would require no additional investment from the City. The City will need to ensure that existing staff are well versed on the new policies and practices of the program and that enforcement efforts are ensuring proper use of the spaces.

Data Collection

Data collection is an important and necessary component to a variable parking pricing program, as it is the key to determining how parking utilization is responding to pricing adjustments. The data collection component is a primary outlet for informing changes to meter rates and restrictions. Methods for collecting parking data vary widely, ranging in cost, efficiency, and data accessibility. The following identifies three data collection methods typically used in variable parking pricing programs.

High-tech: In-Ground Sensors

In-ground vehicle sensors detect when a vehicle is present in the space. This information is sent to a data management warehouse, where parking occupancy data and turnover is analyzed. While sensors provide a continuous, in-depth view into the use of the on-street parking system, they have high operation and maintenance costs. Other variable parking pricing pilots have discontinued the use of sensors due to the on-going costs.

Although the cost of sensors can be a deterrent, many communities have observed and understand the benefits that sensors provide to the parking system, the user, and the overall community. In some cities, the data generated from the in-ground sensors have been beneficial to support directed enforcement efforts and the ability to reset meters after a vehicle has left the space, increasing revenue generating capabilities. Other cities have found that in-ground vehicle sensors have benefited the community in more intrinsic, rather than monetary benefits, by directing motorists to available spaces through smartphone applications or online mapping tools. These data sources are indirectly helping to reduce congestion and vehicle emissions and enhancing the parking experience.

While the capital and ongoing costs of in-ground sensors are prohibitive, the City should consider the overall benefits that in-ground sensors might provide to the community as part of the variable parking pricing program. Outside sources of funding, such as grants or vendor support might lessen the burden of financing the installation, operating, and, maintenance costs to justify the acquisition and use of sensors in the pilot. After the pilot, the City should consider whether these data sources are accurate and reliable, helping to justify ongoing costs.

Mid-tech: Manual Data Collection

Manual data collection requires teams of data collectors to go out into the field to count parked vehicles along a block face for a specified period. Data collection efforts could be conducted annually or throughout the year, depending on how often rates are to be adjusted and how often the City would like to test how variable parking pricing is affecting parking behavior. Manual data collection should be conducted at similar times of year so that data comparisons are for similar conditions seasonally.

Manual data collection is a large undertaking, as it requires groups of individuals to spend hours collecting and analyzing data. Manual data collection is also prone to human error that may result in skewed or inaccurate parking occupancy information. While manual data collection is prone to error, takes time, and does not provide real-time data, the costs associated with it are relatively low when compared to the High-Tech sensor approach, especially if data collection is conducted using existing staff rather than a third party.

Low-tech: Transaction Data

A recent performance pricing pilot study at Carnegie-Mellon University relied on monthly revenue and transaction data gathered from the system's pay stations to identify parking occupancy and apply rate adjustments accordingly. This same strategy could be used in the variable parking pricing program as a low-cost option to determine approximate parking occupancy, using the data generated by the existing pay-by-space parking meters. In this strategy, the total hours parked in a month (determined through meter data) would be compared to the total hours of parking available for the month to identify approximate parking occupancy. The formula below represents how parking occupancy would be calculated.

$$Parking\ Occupancy\ Estimate = \frac{Total\ Hours\ Parked\ in\ a\ Month}{Hours\ of\ Enforcement\ x\ Days\ in\ Month\ x\ \#\ of\ Meters}$$

The data should be compared on a month-to-month basis to determine the effects of parking rate adjustments. Months should be compared on an annual basis (i.e. July 2015 to July 2014) as well as periods immediately before and after the rate adjustment.

The parking occupancy estimate provided by the above calculation is less accurate in identifying occupancy than collected occupancy data. However, the calculation can still be used to understand the impact of rate changes on parking behaviors in the on-street system.

Recommendation: The City should evaluate each of these approaches during the implementation phase of the program to determine which approach provides the best benefits and associated costs. It will be up to the City to identify which option will be best suited for this variable parking pricing program based on funding availability and appropriation.

Non-Metered On-Street Parking

Although variable parking pricing is primarily focused on modifying parking prices to affect changes in parking behavior, the program ca not disregard the system's free, non-metered spaces that also are a part of the variable parking pricing pilot's sphere of influence. When the variable parking pricing pilot is implemented and prices are structured to balance demand across the system, non-metered parking located throughout the Downtown area will likely observe an increase in demand from parkers looking for cheaper parking options. In the future, parking demands may increase within the free non-metered blocks to a level where installation of parking meters will be necessary to balance demands. As such, it will be important to monitor the impact pricing has on shifting demand towards these non-metered locations by including these areas in the data collection effort.

The City of San Francisco's SFPark program has a policy in place that defines when parking meters should be added in non-regulated areas. This policy is based on the occupancy observed in the area along each block face. While observed occupancy is a primary factor for determining the appropriateness of meters, SFPark also includes several other considerations in the analysis, including adjacent land use, input from community outreach, trip generation data, nearby demand generators, and management continuity. While each area is evaluated on a case-by-case basis, SFPark generally considers the following locations appropriate for meters:

- Commercial and mixed use areas

- Public destinations that typically generate high demand, including transit stations, stadiums, universities, hospitals, tourist attractions, and civic buildings

- Public parks, recreational facilities, and open space

- Major transportation corridors

- High density residential buildings

SFPark uses the table[1] below as a practical policy to analyze the land use, zoning, and occupancy in an area to determine if meters are an appropriate parking management tool.

TABLE 2: SFPARK METER ADDITION POLICY PARAMETERS

ZONING	PEAK OCCUPANCY > 80%	PEAK OCCUPANCY 60% - 80%	PEAK OCCUPANCY <60%
Residential - Low Density	RPP[2]	Unregulated	Unregulated
Residential - Medium Density	Further Analysis[2]	Further Analysis[2]	Unregulated
Residential - High Density	Meter	Further Analysis[3]	Unregulated
Mixed Use	Meter	Further Analysis[3]	Unregulated or Time Limit
Industrial/PDR	Meter	Further Analysis[3]	Unregulated or Time Limit
Neighborhood Commercial	Meter	Meter or Time Limit	Unregulated or Time Limit
Public	Meter	Meter or Time Limit	Unregulated or Time Limit
Downtown	Meter	Meter or Time Limit	Meter or Time Limit

Recommendation: While it might not be financially feasible or appropriate to install sensors within these non-metered blocks, targeted manual data collection efforts should be conducted to understand how variable parking pricing strategies are influencing parking demand. In areas with increasing parking demand, the City and MPA should consider the addition of metered spaces, based on the characteristics outlined by SFPark.

1 "Policies for On-Street Parking Management," SFPark (2012). http://sfpark.org/wp-content/uploads/2012/09/20120828SFMTAPoliciesforOn-StreetParkingManagement1.pdf

2 For a block/area to qualify for RPP more than 50 percent of parked cars must be attributable to commuters. This is measured by a license plate survey from a sample of vehicles. This analysis is part of the routine review of RPP applications.

3 The built environment within these zoning categories varies significantly in density and context. As a result, further SFMTA analysis as outlined in this document will help determine the correct tool for these blocks. For example, there are some blocks with many single-family homes in these categories, which may be best managed using the RPP program, but there are also multi-level apartment buildings adjacent to commercial corridors which may be best managed by parking meters.

COMMUNICATION

With the implementation of variable parking pricing rates, it is important that variable meter rates and policies are effectively communicated to the parker to reduce confusion and frustration, and to promote a better understanding of how the parking system operates. The following section will identify specific communication strategies geared towards communicating rate information to the driver that should be implemented in the variable parking pricing program.

Signage

On-street parking signage typically communicates parking restrictions to the driver, allowing them to make decisions on the most appropriate place to park. While traditional on-street parking signage might identify parking restrictions and hours of enforcement, signage within a variable parking pricing program area might also include other indicators that identify cheaper and more expensive parking options. Indicating low and high cost parking to drivers allows them to decide whether they are willing to pay the premium

Seattle Performance-based Pricing Signage

to park in high demand areas or if they should find a cheaper, less crowded, place to park. The communication of price or rate should be limited to defining premium parking areas and value parking areas on the signage. Communicating the actual rate can be cumbersome and confusing to the driver. Additionally, the cost to change signs during subsequent adjustment periods can be extremely high.

Dynamic Message Signs

In some variable parking pricing programs, such as LA Express Park, on-street dynamic message signs (DMS) are used to communicate rate information and real-time parking availability to motorists. While the use of permanent DMS is a good opportunity to quickly relay real-time information to motorists, DMS are costly. Another option to inform the public of rate changes could be the use of temporary variable messaging signs (VMS), which were used in the Seattle Performance-Based Parking Program. While VMS are not capable of communicating real-time parking availability, they do provide an opportunity to broadcast upcoming changes to parking rates to the public on a larger scale than static on-street signage.

Smartphone Applications

Data from the meters related to rate and availability could also be communicated through a smart phone application if the City should choose to partner with a vendor to provide this information. The provision of a smartphone application could help with patron wayfinding and improve overall customer satisfaction.

At the Meter

The final location where meter rate information should be communicated to the driver is at the meter. Rate information can be displayed on the meter interface and can also be applied to the body of the meter using a sticker. This sticker must be removed and updated each time rates are adjusted.

LA Express Park Permanent Dynamic Message Signs
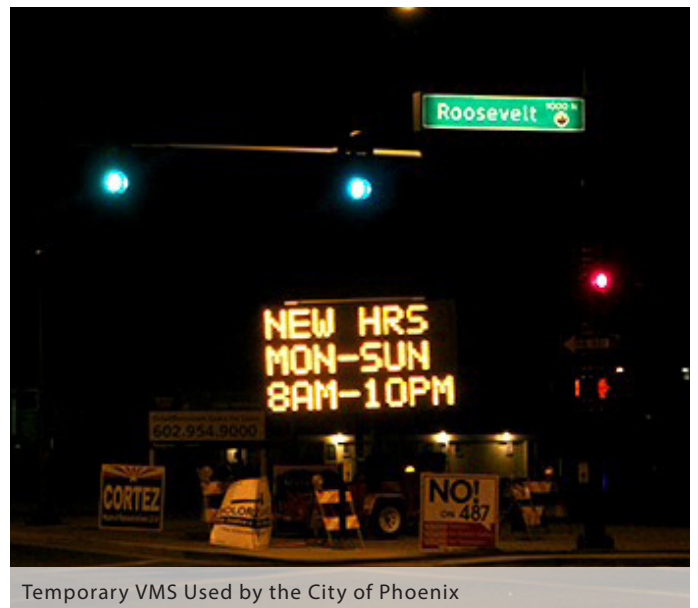
Temporary VMS Used by the City of Phoenix

OUTREACH

Customer outreach is an essential piece to educating the public on the goals, objectives, and regulations of the variable parking pricing program. Outreach efforts should aim to market and educate neighborhood groups, organizations, and the public on the new policies, regulations, and practices of the variable parking pricing program. The goal of outreach is to encourage understanding and compliance with the new program. The following section summarizes the different outreach efforts that could be implemented as part of an on-going stakeholder outreach campaign. While the final stakeholder outreach campaign will likely contain a combination of outreach efforts, it is essential that branding and messaging remain clear and consistent throughout to support customer recognition, understanding, and support of the variable parking pricing pilot program.

Website

Many times, visitors plan where they are going to park by researching parking options online. For a fully functioning variable parking pricing program, it is imperative that the parking rates and rate adjustments are properly communicated to the public to reduce confusion and driver frustration. In addition to communicating parking rates, the City's website provides an excellent opportunity to educate the public on the variable parking pricing program. The website should be expanded to include information on the program such as:

- A description of the program purpose and how it works

- The goals of the program

- The benefits the program provides

- Program area map

- Frequently asked questions

- Program contact information

- Annual data collection results

- Rate adjustment announcements

- Rate structure

- Parking maps and associated rates

Videos

Another opportunity to educate the public on the pilot program is to produce a short video that explains variable parking pricing program elements, including the purpose behind the pilot, pilot

pricing strategies, and benefits the pilot will provide. This video should be posted on the City's website and YouTube channel, as well as be distributed to other media outlets, including television and other websites to reach a wider audience.

Smartphone Application

Smartphone apps provide easily accessible information and vehicle navigation to motorists. Information included in a smartphone app could include parking locations, rates, restrictions, and real-time availability (if technology permits). In many cases, cities provide their parking data in an open-source format, to allow interested smartphone app developers to incorporate the data into a larger network at no cost to the City. Such smartphone app developers include ParkMe and Parkopedia, who are more interested in creating a database of parking information on a national scale than developing individual parking apps for cities. The type of data sources that could be fed into the development of a smartphone app could include sensor data (if implemented) and meter transaction data for on and off-street facilities. At the time of this report, Google has recently implemented a parking difficulty feature in pilot communities (Atlanta, Charlotte, Tampa, Phoenix, and 20 other locations) that provides information about how challenging parking will be based on an input destination. It is envisioned that future iterations would also be able to help determine less challenging parking within a proximate distance from the user's destination.
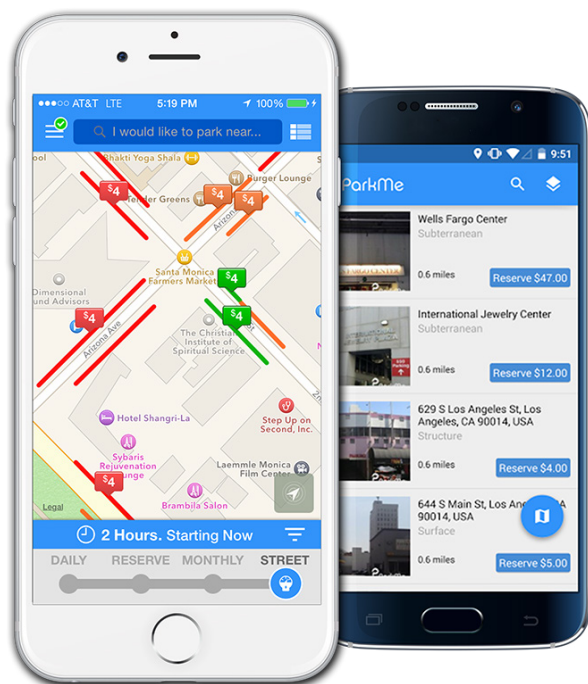
Print Media

While more and more parkers rely on web-based media to find information on parking, print media, such as newspapers and magazines, still reach a broad audience and should still be considered a valid opportunity for marketing and customer outreach. When compared to web-based media, print media advertisement is relatively cost effective, and the same advertisement can be used in multiple publications.

As part of the branding and marketing campaign process, the City should produce graphics for print advertisements. These ads should be consistent with the branding color theme and message for the overall program to encourage customer recognition of the program and to communicate a consistent message regarding the program to customers.

The advertisements developed for print media should also be developed into posters that can be distributed to Downtown businesses and organization, displayed in City buildings, posted at bus stations, and hung in other high traffic areas.

Social Media

The use of social media in parking is becoming increasingly popular due to the widespread access it has to consumers, as well was the increased use of social media based smartphone applications. Social media sites provide a platform to quickly and easily communicate updates to the program, changes to parking rates at no cost to the City. The City should use its existing Facebook, Twitter, and YouTube accounts to market the variable parking pricing program.

Packet

Before the pilot program is initiated, the City should develop a packet to be distributed to area businesses, organizations, and neighborhood groups that contains information on the new pilot program. The packet should be developed for electronic and print distribution and should include:

- A description of the program, including how it works and the benefits it will provide to the community

- Information on how to use the new parking system

- Information on how the program is structured including the length of the initial pilot and the rate setting policies

- Information on how users will be notified of rate changes

- Marketing materials such as posters, print ads, and videos

Enforcement Officers

Parking enforcement officers interact with parkers daily, and are a great resource to speak with the public regarding the variable parking pricing program. The parking enforcement officers should be educated on the objectives of the program and how it works so that the message of the program is communicated effectively to motorists.

LOADING ZONES

The second most predominant use often found along the curb in an urban environment is the loading zone. Loading zones are especially important for the movement of goods and people for urban businesses. In the City of Raleigh, there are seven types of loading zones—taxi, valet, passenger, materials, truck, commercial vehicle only, and musician. Loading zones are designated at the discretion of the City Manager and locations are decided on a case-by-case basis. Historically, most the loading zones were commercial, but over time the other types of zones have been added.

EXISTING CONDITIONS

The provision and use of loading zones is defined by the City Code of Ordinances. Generally, loading zones are restricted to either passenger or non-passenger loading. Each type of loading zone requires a sign indicating the hours of regulation. Downtown Raleigh has a total of seven loading zones types, three passenger and four non-passenger.

PASSENGER LOADING ZONES

Passenger — Based on the requirements in the ordinance, passenger loading zones are restricted to ten minute durations and are enforced 7AM-6PM, Monday through Friday.

Taxi — Downtown Raleigh experiences activity from the early afternoon into the late evening hours, largely, because of the restaurants, drinking establishments, and entertainment venues located in the area. Consequently, many taxis congregate in Downtown to serve these late-night patrons. The City established designated taxi stands along specific corridors to provide the public with easy and consistent access to taxis, and manage taxi queuing.

There are six designated taxi zones within the Downtown and one taxi zone which shares the curb with a commercial loading zone during off hours. Loading time regulations are inconsistent throughout the Downtown apart from generally serving evening hours. Taxi parking is used during the following hours: 9AM-4PM; 6PM-7AM; 10PM-6AM; 6PM-6AM; or in some instances, there is no time limit.

Valet — There are six valet loading zones and one valet loading zone that shares curb space with a commercial loading zone during off hours. These zones are centered around the two main entertainment and dining districts in the Downtown—the area on and around Glenwood Avenue and Fayetteville Street. These designated zones can only be used by a licensed valet and require both a permit and a privilege license. The permit is $250 per year and is only in effect during designated hours. Additionally, on-street valet curb space rent is paid for by the business or the valet company.

Non-Passenger Loading Zones — There are four types of non-passenger loading zones in Downtown Raleigh—truck, materials, commercial, and musician. Per the ordinance, truck loading refers to the loading and unloading of merchandise from any truck. It does not give restrictions to type of truck. These zones are restricted to this use 7AM-6PM Monday through Saturday. Per the ordinance, materials loading refers to the loading and unloading of merchandise in a marked a marked loading zone. These zones have a 60-minute time limit and are restricted 9AM-5PM Monday through Saturday. Commercial loading functions the same as material loading apart from the distinct factor of requiring a logo or commercial license plate on the vehicle. This loading zone type is restricted 6AM-6PM Monday-Friday.

Per the ordinance, musician loading refers to the loading and unloading of musical instruments and equipment and requires a special musician loading permit. This loading zone type is restricted 5PM-3AM Monday through Saturday and the locations of these zones generally fall within entertainment areas.

BEST MANAGEMENT PRACTICES

The best management practices for commercial and passenger loading are provided below. The central tenet of these recommendations is to provide consistency and ease of understanding for Downtown Raleigh patrons, while also restricting the ease with which these space types can fragment the curb side system. The reduction in curbside fragmentation should help improve management and operations from the City's perspective, and is accomplished by appropriately monetizing the use of the curbside space and limiting unfettered access to the spaces.

PASSENGER LOADING — TAXIS

Separating taxi operations from other users along the curb allows for better curb management practices while still providing space for passenger loading. In addition, it is not always necessary to provide taxicab parking along every block since not every land use requires the need for taxicab services. Future efforts to locate taxicab stands should assume that people will be willing to walk a few blocks to a dedicated taxicab stand.

When taxicab stands are required on a block, it is recommended that they be located at the end of blocks, near intersections, to provide a buffer for pedestrians using on-street parking spaces or transit passengers loading and unloading. **To promote a higher and better use of curbside space, it is recommended the City consider more transitional spaces that serve commercial loading throughout the day and taxi loading during the evening.** This configuration creates very little conflict between the user types and promotes a more efficient use of curbside space.

PASSENGER LOADING — RIDESHARE/ CARSHARE

With ride sharing companies such as Uber and Lyft growing in numbers, many patrons choose this option rather than taxis due to convenience, ease of use, and in many cases, cheaper prices. While these options do not currently create traffic issues in Downtown, as they become even more prevalent they can create congestion due to the roving nature of operation versus a designated taxi stand. To combat this, **it is recommended that centralized pick-up and drop-off locations be designated to ease the flow of traffic and to provide a better service to customers.** The City also should coordinate patron volume with operators to by sharing data to help operators efficiently staff high-demand periods. These centralized pick-up and drop-off locations could use commercial loading areas after hours, depending on predominant times of operation data. The centralized rideshare locations should also be located several blocks from one another, minimizing congestion and promoting a more walkable urban environment in Downtown Raleigh.

Car sharing is another up and coming trend that gives patrons the freedom of driving themselves without having to own an actual vehicle. The best strategies for an effective car sharing program are to provide access to vehicles in convenient locations as well as locate optimal locations for car share curb space permit parking. Best practices have shown that requiring a certain number of vehicles in lower-income neighborhoods provides more opportunities and freedom to those that wouldn't normally drive. By requiring that the car sharing organizations provide annual travel behavior data on their members to the municipality, the City gains valuable information they might not receive otherwise, at least not on the annual basis. Additionally, by requiring some level of revenue payback for designated spaces, the City gains any revenue they would have received had the space been unpermitted. Car share spaces are best served in off-street lots or garages, but if the car sharing companies request on-street placement, the City should require a return on revenue for dedicated or used parking spaces.

PASSENGER LOADING — VALET

Valet stands should be located at or near the center of a block face, where vehicular queuing is less likely to impact traffic operations at nearby intersections. Centralized placement of valet stands will minimize conflicts and create uniformity in Downtown. Using a centralized location also allows multiple valet stands to be combined, serving several businesses on one block face.

Building upon this centralized approach, valet stands should be restricted to one operation per block face, which should limit the pedestrian and traffic flow disruption. More importantly, limiting to one valet stand per block will minimize the number of on-street parking spaces removed for valet transfer.

VALET FEE STRUCTURE

While the City currently collects an annual application fee of $250 per valet operation, additional fees should be collected to monetize the valuable curb space that is being used by valet services. Suggested additional fees include both operations and parking obstructions:

OPERATIONS FEE

The operations fee would require the valet companies to pay a basic fee to operate a valet stand in Downtown. This fee would be collected annually and would be paid for per valet stand. If a valet company operates multiple stands in Downtown, a premium price would be paid for the first stand and reduced fee would be assessed for additional stands.

PARKING OBSTRUCTION FEE

The parking obstruction fee would require the valet parking operator to pay for the valuable on-street parking spaces that would be removed for valet services. This fee is intended to encourage the valet operators to efficiently use the curb space and minimize impacts to on-street parking. The parking obstruction fee would be assessed annually and be paid for per removed space.

COMMERCIAL LOADING ZONES

The City currently has multiple types of commercial loading zones in the Downtown area. Consideration should be given to combining loading zone types to minimize confusion and management responsibility. The introduction of tiered permits and off-peak loading incentives can help to reduce the peak needs for commercial loading spaces. Also, it is recommended that commercial loading zones be placed at the end of the block face, closest to the intersection to provide a buffer for pedestrians using on-street parking or transit stops.

OFF-PEAK LOADING INCENTIVES

The City should consider providing incentives for commercial vehicles to provide off-peak (before 10AM) deliveries in the Downtown. This could include free-use of on-street metered spaces for short durations with a registered (and/or permitted) commercial vehicle. This flexibility allows commercial operators to better access their customers without the competing needs along the curb. And it promotes less congestion during peak daytime demand hours for the City.

COMMERCIAL LOADING PERMITS

It is recommended that businesses buy an annual or temporary loading zone permit in various classes to provide several choices to suit their operational needs. The following Commercial Loading Zone (CLZ) permits are recommended for the Downtown area to meet the shipping needs of businesses.

TIER	COST	ALLOWANCES	ADVANTAGES	DISADVANTAGES
1	$$$	Greatest flexibility – park in any space at any time of day	Maximum flexibility for time and location	High permit cost
2	$$	Before 10AM – Park anywhere without payment After 10AM – park in commercial zones only	Allows for flexible delivery timing and maximum access during non-peaks	Does not allow for flexible afternoon or evening loading
3	$	Deliveries allowed from 5am to 10am only, any metered space	Low Cost	Delivery time is restricted to morning hours only

By providing three different permit tiers, businesses will be allowed to park for longer periods of time and will have more flexibility on where they can park. The fees for the permit also provide additional revenue for the City.

Delivery vehicles also would be allowed to park at Commercial Meters placed in commercial loading zones that have a much higher rate than other on-street parking meters (the City of Houston's is set at $5.00 per hour). The purpose for this is to discourage non-delivery vehicle parking and long-term use of the spaces. For the same purpose, the violation fines are also set higher.

Price as a management strategy discourages carriers from parking during the most congested periods through high permit prices and meter fees, and encourages others to park during the least congested periods at a cheaper cost. Coupled with price is the time restriction element that balances commercial activity to off-peak periods. If a carrier prefers a lower cost permit, they are restricted to the period with the least congestion. If a carrier wants to conduct deliveries throughout the day, including during the most congested periods, they must pay a higher price.

RESIDENTIAL PERMIT ZONES

The Historic Oakwood neighborhood in the northeast portion of the Downtown is regulated by a residential permit parking program. The residential permit parking program allows for restricted parking during certain times of the day. The registered vehicles that can participate in the program must apply and, after receiving the permit, the motorist must affix a decal in their vehicle's rear window, or rear fender of motorcycles. The decals cost $20 annually for a permanent parking permit and residents are eligible for one permit per vehicle.

While the City has eight residential permit program in place today, as the area continues to densify and the number of Downtown residents increases, the City should consider the implementation of a few strategies to improve neighborhood parking protection, without minimizing the ability for on-street parking to support commercial growth. These include:

- Future implementations of residential parking areas should be made using data-driven decisions, including parking occupancy and supply need

- In areas of high demand for both commercial and residential parking, consider higher priced residential permits, incentivizing the residents to park off-street and leave higher priority spaces on-street for high turnover activities at retail and restaurants.

- As an alternative approach to residential parking management, to monetize the curb space in the residential areas, the City should consider installing parking meters in neighborhoods with commercial activity in a walkable distance. Parking meter fees would be waived for anyone with a visible parking permit (or guest parking pass).

  - Parking meters are only operational between 8AM and 5PM Monday through Friday. All other times are restricted to residents.

  - Guest parking could be extended beyond the 2-hour limit by charging for parking beyond the 2-hour limit of the guest pass.

- Taxi and valet stands should be prohibited on residential streets, because their use and operation is detrimental to the residential nature of the areas.

- Loading zones should be allowed and interspersed throughout the residential neighborhoods to assist delivery vehicles and moving trucks, with the caveat that commercial loading is prohibited in these areas.

OTHER CURB LANE USES

Beyond parking and loading areas, there are several auxiliary curb lane uses that could be considered along the curbside environment, including parklets, transit stops, bicycle parking and food truck usage. The following sections document existing conditions in Downtown Raleigh, as well as best management practices for evolving and managing the programs.

PARKLETS

One innovative use of curb space that is emerging throughout cities in the United States is the "parklet" concept. A parklet converts underused curb space and transforms it into a public gathering place, and can be used as seating areas, green space, café patios, or even bar extensions. Parklets benefit the community by maximizing underused space within the City, while providing an enjoyable place to gather. By encouraging the public to gather within parklets, pedestrian activity surrounding the parklet increases, which can translate into higher activity in nearby businesses.

The intent of the parklet is to:

- Increase pedestrian activity and use of outdoor space primarily in less active areas of downtown

- Expands outdoor dining or retailing opportunities for individual businesses and is best located in less active areas

- Benefits the sponsoring establishment from an economic standpoint

- In less active areas and where an increase in activity is desired, parklets provide an ownership incentive for the sponsors to help activate those locations and may accomplish that goal better than preserving on-street parking

- Parklets should be an aesthetic enhancement

The City currently has one parklet. Permits for new parklets are reviewed by the Urban Design Center and are allowed in the Downtown Overlay District and Pedestrian Overlay District only. The street speed must be 35 miles per hour or less. The City requires a fee for the removal of the on-street space. This fee is based on the loss of parking revenue, based on 100% occupancy during enforcement and revenue collection periods. **The City should consider evaluating the potential sales tax revenue increase of increased business as an offset of the cost to operate the parklet for businesses.** The increase in other forms of revenue, as well as the increased pedestrian activity and downtown vitality, should be considered as a beneficial return.

Future options to install a parklet include:

- **Removing a Metered Space** — This option might be more controversial to the public. However, the loss of parking revenue may be offset by the increase in urban vitality and increased business activity, which may in turn generate more sales tax revenue.

- **Taxi and Commercial Loading Zones** — With the implementation of the commercial and taxi loading recommendations, more loading space will be made available for taxi and delivery operations. Thus, there is an opportunity to use a portion of the existing loading space for a parklet.

- **Seasonal Parklets** — This option would implement moveable parklets that would be in use during higher pedestrian activity seasons (spring, summer, and portions of fall), returning the space to a parking spot during colder months when patrons are looking for a more convenient and proximal space to park.

BUS STOPS

General recommendations and standards for locating transit stops along the curb lane were developed to support vibrant usage of the Downtown transit system without impeding the provision of a maximum amount of on-street parking spaces. Transit operations in Downtown Raleigh are managed by the City of Raleigh (and branded as GoRaleigh). With the passage of the transit sales tax in November, transit use is growing in presence and priority in Downtown Raleigh and curb lane regulations need to be responsive to that growth.

BEST MANAGEMENT PRACTICES

The bus services in Downtown Raleigh currently require dedicated space along the curb lane to load and unload passengers. For the day-to-day operations to run smoothly and to provide reliable service to passengers Go Raleigh relies upon their stop locations to be clear and unobstructed at all times. The provision of efficient transit operations and reliable service to passengers promotes multimodal operations, sustaining Raleigh's growth as a dynamic *park once* City. Because vehicles illegally parked or encroaching onto stop locations are detrimental to transit operations, these vehicles should receive heavy fines.

The locations of bus stops are important to system operations. Locating stops close to intersections is recommended for GoRaleigh operations. Existing bus stop locations in the Downtown area currently are at arbitrary locations on each block face. To minimize potential conflicts, bus stops should be located at the ends of the block to the extent practicable.

It is recommended that GoRaleigh evaluate ridership data and look to potentially combine bus stops where the fewest boarding's are currently occurring. By minimizing the number of bus stops, the operation of bus routes becomes more efficient and the disruptions to vehicular traffic could be minimized. Going forward, the City Parking staff should work with GoRaleigh to determine locations where feasible as the study is implemented, without disrupting operations and rider expectations.
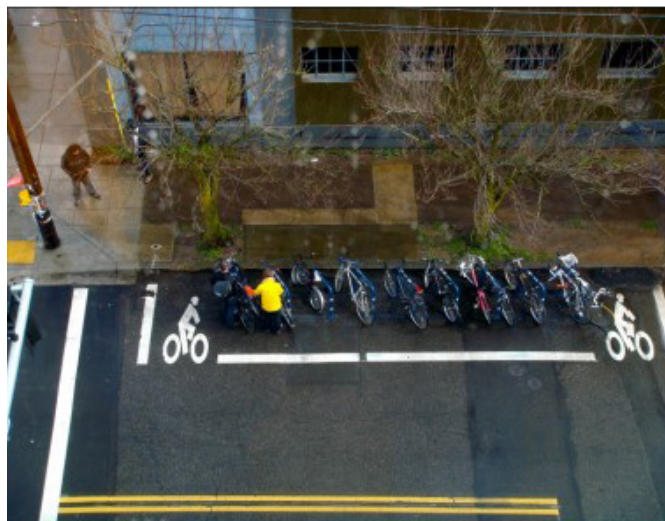
ON-STREET BIKE PARKING

Those who bike to Downtown Raleigh rely on various forms of bike parking located throughout the City to conduct their daily activities. Providing sufficient bicycle parking is essential for supporting cycling, as it acts as the link from first to final destination. The benefits of supporting bicycling and providing adequate bicycle parking include the following:

- Economic Incentives

  - Bike parking takes up 10 times less space than a vehicle space, and can fit 8 to 12 more customers in the same amount of space as one vehicle

  - One study in Toronto, Canada found that cyclists and pedestrians spent more money in area businesses in comparison with drivers

- The cost of providing for bicycle parking demand is much lower than the cost of accommodating vehicular parking demand, where new parking spaces can range from $5,000 - $30,000 per space to construct

- Over three times more bicycles are sold in the United States than vehicles

- One study in Melbourne, Australia found that bicycle parking spaces generated five times more revenue ($31 per hour) than vehicular parking spaces ($6 per hour)

- Social

  - Cycling contributes to physical and mental health improvements, contributing to a healthy community

  - Commute trips by bicycle increased 10% from 2011 across the nation, bicycle infrastructure supports the needs this growing population environmental

  - Bicycling contributes to reduced emissions, traffic congestion, and fossil fuel use contributing to improved air quality

BICYCLE PARKING STRATEGIES

The table below and on the following pages provides a summation of potential bicycle parking strategies to consider.

ON-STREET BICYCLE PARKING

Potential Cost: $1,000 - $3,000

On-street bicycle parking has been used in areas that have constrained sidewalk space or a need for expanded bicycle parking capacity. On-street bike parking corrals are typically able to park 8 to 12 bikes within one car space. Bicycle parking elements could range from traditional racks bolted to the street pavement, to more elaborate and decorative racks that denote the space to motorists clearly. The clear downside of on-street bicycle parking is the removal of on-street vehicular spaces, which could impact vehicular parking demands. However, using the street space for uses other than vehicles promotes alternative modes of transportation in the street system. Setting the proper criteria of feasible locations for location selection is key to the success of on-street bicycle parking.

The City of Portland has installed 85 bicycle corrals which replaced 144 automobile spaces and provided 1,442 bicycle spaces. For businesses interested in installing a bike corral, the City requires business owners to pay a fee to offset lost meter revenue within areas with metered parking.

TIERED BIKE PARKING

PPotential Cost: $317 - $386 per space

BTiered bike parking maximizes available space by doubling up available bike parking in two tiers. Users can easily place a bicycle on the upper rack by lowering the rack to ground level. Most tiered bike racks are compatible with U-locks for increased security. Tiered bike racks are suitable for both indoor and outdoor use.

The City of Tempe Bike Cellar used a tiered bike parking system to maximize the amount of bicycles that can fit in the facility.

BICYLE PARKING IN GARAGES

Potential Cost: $100 per traditional rack - $30,000
(approximately 50 space bike cage)

Bicycle parking in garages provides sheltered, long term bicycle parking that maximizes use of additionally unused space within the garage. Parking in garages may be in the form of bicycle U-racks, wall racks, cages, or lockers depending on available space, funding, and needs of the specific area. To implement garage bicycle parking, cities may require garages to install bicycle parking as requirement through ordinance.

Bicycle parking is found in a few of the City of Tempe's parking garages, including the US Airways and the City Hall garages.

The City of New York requires parking facilities with 100+ spaces to provide one bicycle parking space per 10 cars (up to 20 spaces).

METER RETROFIT

Potential Cost: $21 - $100 per wall mount
$317 - $386 per tiered space

Bike rooms offer indoor long-term bike parking, most typically for commuters and residents and are therefore most applicable in office and multifamily residential uses. Bike rooms can also include lockers, showers, and other self-service tools to serve users. To encourage the development of bike rooms in private developments, some cities have included a stipulation in the code that requires developments of a certain size to provide a bike room.

The City of San Francisco requires all city owned or leased buildings to provide long term bike parking, either through bike rooms or lockers, for employees.

CREATIVE BICYCLE PARKING

Cities are beginning to become more creative with bicycle parking, veering away from traditional U-racks and installing artist inspired racks. In in addition to serving the functional purpose of providing a place for people to park their bike, decorative bike racks offer greater benefits to the community. These eye-catching designs:

• Encourage bicycling as a mode of transportation

• Promote the area as a bicycle friendly community

• Can be custom designed to reflect and promote a neighborhood's distinct character or a business purpose

• Enhance the public realm by acting as de facto public art installations

These creative bicycle racks are functional, yet simple touches like these provide a lasting impression to cyclists and Downtown patrons. It should be noted that these types of creative bicycle parking facilities tend to sacrifice function for improved aesthetics. The City will need to weigh the importance of improved urban space with the need to maximize bicycle parking capacity while minimizing space used at the curb side.